Geophysical Research Abstracts
Vol. 12, EGU2010-4326, 2010
EGU General Assembly 2010

Seismic Anisotropy Analysis in the Victoria Land Region (Antarctica)

Simone Salimbeni, Silvia Pondrelli, Stefania Danesi, and Andrea Morelli
Istituto Nazionale di Geofisica e Vulcanologia, sez. Bologna, Italy

We present shear-wave splitting results obtained from analysis of core refracted teleseismic phases recorded by permanent and temporary seismographic stations located in the Victoria Land region (Antarctica). We used eigenvalue technique to linearize the rotated and shifted shear-wave particle motion, in order to determine the best splitting parameters. A well-scattered distribution of single shear-wave measurements has been obtained. Average values show clearly that dominant fast axis direction is NE-SW oriented, accordingly with previous measurements obtained around this zone. Only two stations, OHG and STAR show different orientations, with N-S and NNW-SSE main directions. On the basis of the periodicity of single shear-wave splitting measurements with respect to back-azimuths of events under study, we inferred the presence of lateral and vertical changes in the deep anisotropy direction. To test this hypothesis we have modelling waveforms using a cross-convolution technique in one and two anisotropic layer's cases. We obtained a significant improvement on the misfit in the double layer case for the cited couple of stations. For stations where a multi-layer structure does not fit, we looked for evidences of lateral anisotropy changes at depth through Fresnel zone computation. As expected, we find that anisotropy beneath the Transantarctic Mountains (TAM) is considerably different from that beneath the Ross Sea. This feature influences the measurement distribution for the two permanent stations TNV and VNDA. Our results show a dominant NE-SW direction over the entire region, but other anisotropy directions are present and find an interpretation when examined in the context of regional tectonics.